Bunya Bunya Pine

Araucaria bidwillii

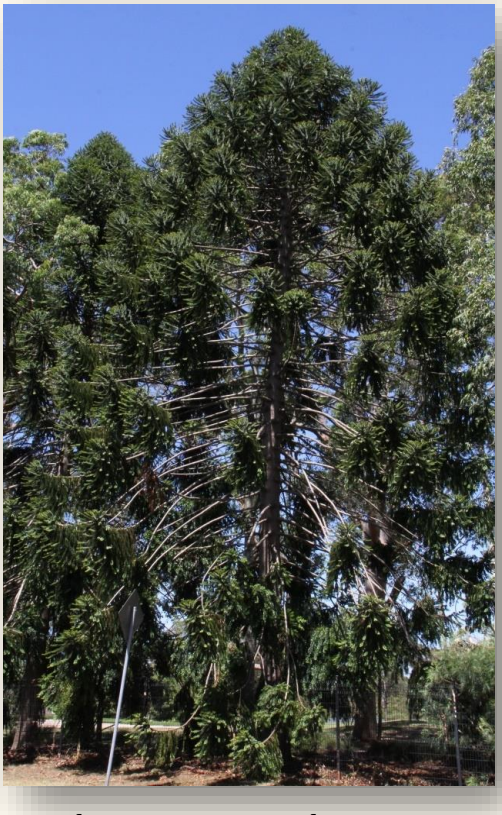
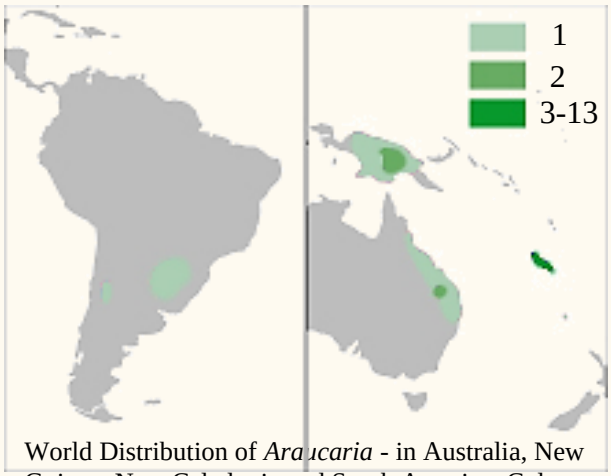


Photo: Ross Peacock

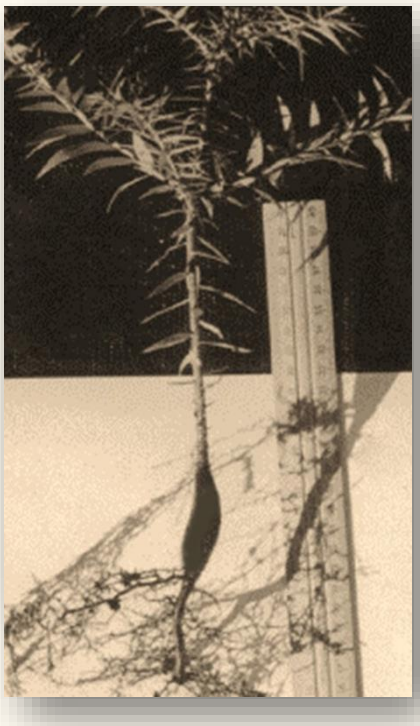
Bunya Bunya Pines are iconic trees in the Australian landscape. Their broad, rounded, dark green crowns often feature in parks and gardens and in the grounds of grand old houses. They are famous, perhaps infamous, for their massive cones and large seeds.

These extraordinary conifers which grow as emergent trees in subtropical rainforests, are endemic to Australia and grow in two disjunct areas of Queensland. They are probably best known from the Bunya Mountains of south-eastern Queensland but were once widespread, from the Bunya Mountains to Nambour and Gympie where they were extensively logged and the land subsequently cleared for farming. There are isolated populations in far north Queensland, in Mount Lewis National Park north-west of Port Douglas, and in Tully Gorge National Park, west of Innisfail.

As the name implies, they are conifers, but they are not true pines. Bunyas belong to an ancient plant family, the **Araucariaceae,** now with an entirely southern, Gondwanan, distribution. *Araucaria* species can be found in Australia (including Norfolk Island), New Guinea, Chile (Monkey Puzzle), Argentina and southern Brazil, but the greatest number of species (13) can be found in New Caledonia. The family was widespread in both hemispheres during the Jurassic and Cretaceous periods when sauropod dinosaurs are believed to have grazed on the foliage of ancestors of modern-day *Araucaria* species. At the same time as the extinction of dinosaurs at the end of the Cretaceous, *Araucaria* disappeared from the northern hemisphere.



World Distribution of *Araucaria* - in Australia, New Guinea, New Caledonia and South America. Colour coding indicates number of species present.



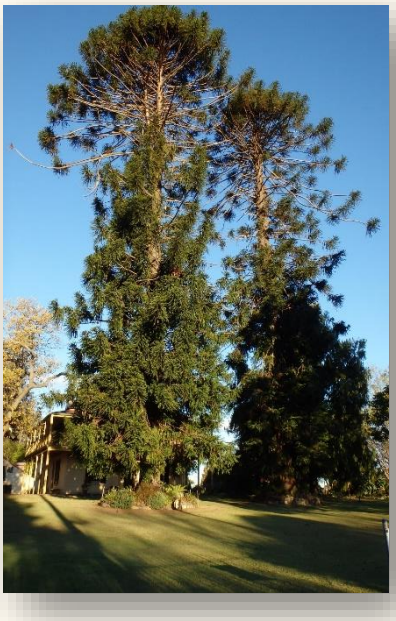
1. Germinating seeds lengthening hypocotyl (first root) with increased diameter to produce a *tuber*.
2. Seedling at 6-8 weeks, lateral roots growing from the tuber.
3. Seedling, one year old, with shoots and roots. The tuber/swollen hypocotyl is still conspicuous.
   From: *Burrows & Stockey, 1994.*

Apart from being exceptionally slow, the seedlings of Bunya Bunya pines form in a rather unusual manner. The first root grows down and forms an *underground tuber*. From this, but much later, a shoot emerges! This is known as *cryptogeal* (hidden, secret) seed germination, and the long period spent underground while the tuber is developing is considered to be a strategy to allow the young seedling plants to emerge with an established energy store when climatic conditions are optimal and/or to avoid fire.

Bunya Bunya Pines produce both male and female cones on the one tree (monoecious and bisexual). Female cones are massive, up to 35 x 20 cm in size, weighing up to 10 kg. There has been much debate about the means of dispersal of the exceptionally large seeds. Dinosaurs and now extinct Australian megafauna may have played a role in dispersal in the past but possums and bush rats are now the prime suspects.

Seeds are edible and are eaten by Indigenous Australians roasted, boiled, ground into paste and baked into 'bread' and even eaten raw. In south-eastern Queensland, approximately every three years, Aboriginal people would gather for 'Bunya feasts'. Only traditional owners could harvest the nuts, and disputes were put aside as all took part in feasting, corroborees and hunting.

The actual shape of the crowns of Bunya Bunya trees changes with age. Young trees have a classic conical - pyramidal shape; upper branches of older trees become dome shaped, conspicuous for their dense trusses of branchlets and leaves.



Bunya Bunya Pines are magnificent trees, with tall, straight trunks and glorious glossy, dark green leaves. However, the cone size is a problem for urban areas as the massive cones can inflict substantial damage on cars, buildings and people. From January to the end of March, Cumberland State Forest in Sydney's north-west limits access to its mixed plantings of Bunya Bunya and Hoop Pines to avoid injuries to those enjoying the walking tracks below.

Burrows G, Stockey S. 1994. The developmental anatomy of cryptogeal germination in Bunya Pine (*Araucaria bidwillii*). *International Journal of Plant Sciences*: 155: 10.1086/297191

Map modified from Australian Native Plant Society (Australia): http://asgap.org.au/a-bid.html

The Gymnosperm Database: http://www.conifers.org/ar/Araucaria_bidwillii.php

Hummel J, Gee CT, Südekum, Sander P M, Nogge G, Clauss M. 2008. In vitro digestibility of fern and gymnosperm foliage: implications for sauropod feeding ecology and diet selection. *Proceedings of the Royal Society B: Biological Sciences* **275** (1638): 1015–1021.

Wikipedia: http://www.conifers.org/ar/Araucaria_bidwillii.php

Wikipedia: http://www.conifers.org/ar/Araucaria

World Distribution map modified from: http://en.wikipedia.org/wiki/File:Araucaria_Distribtion.svg

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